

## Signage as an Intervention on a General Medicine Ward to Reduce Unnecessary Testing

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### ABSTRACT

**Background:** Up to 30% of medical spending in developed countries offers no benefit to patient care. Unnecessary testing is not only wasteful economically, but can be injurious to patients. Previous studies have shown that interventions such as education, auditing, and restrictive ordering can reduce unnecessary testing. However, these interventions are time- and resource-intensive. We conducted a study to determine if the passive intervention of placing signs on clinicians' computers was effective in reducing unnecessary testing.

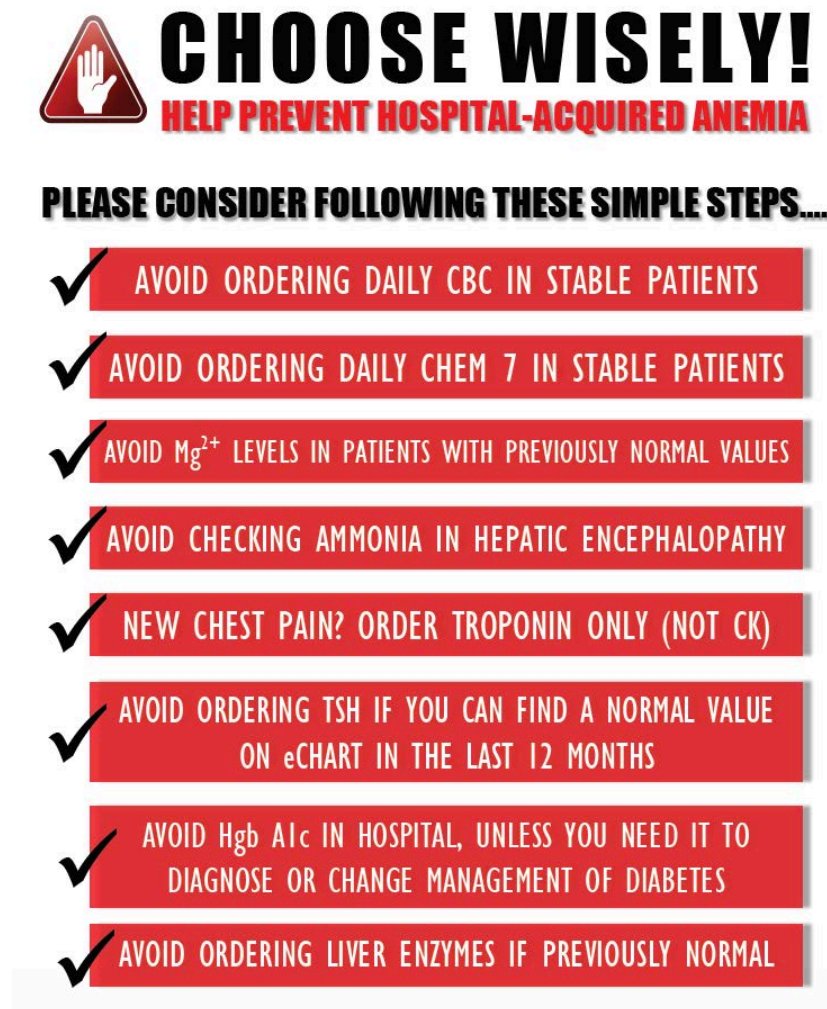
**Methods:** We identified two acute internal medicine wards at an academic tertiary care center on which all orders are placed via computer. On one ward (Ward A), we placed a sign outlining recommendations regarding responsible test-ordering. The other ward (Ward B) acted as a control. Data from Ward A the previous year acted as a historical control. Data was collected for each patient admitted during the 6-month study period to determine whether test-ordering practices differed between the two wards.

**Results:** A total of 1645 patients accounting for 17,786 patient-days were included in the study. During the study period, fewer tests were ordered on Ward A than Ward B (7.38 vs 8.20 tests/patient-day;  $p < 0.01$ ). Additionally, significantly fewer patients on Ward B received  $\geq 1$  complete blood count/day (36.1% vs 42.5%,  $p = 0.04$ ). Similar, although less robust, results were

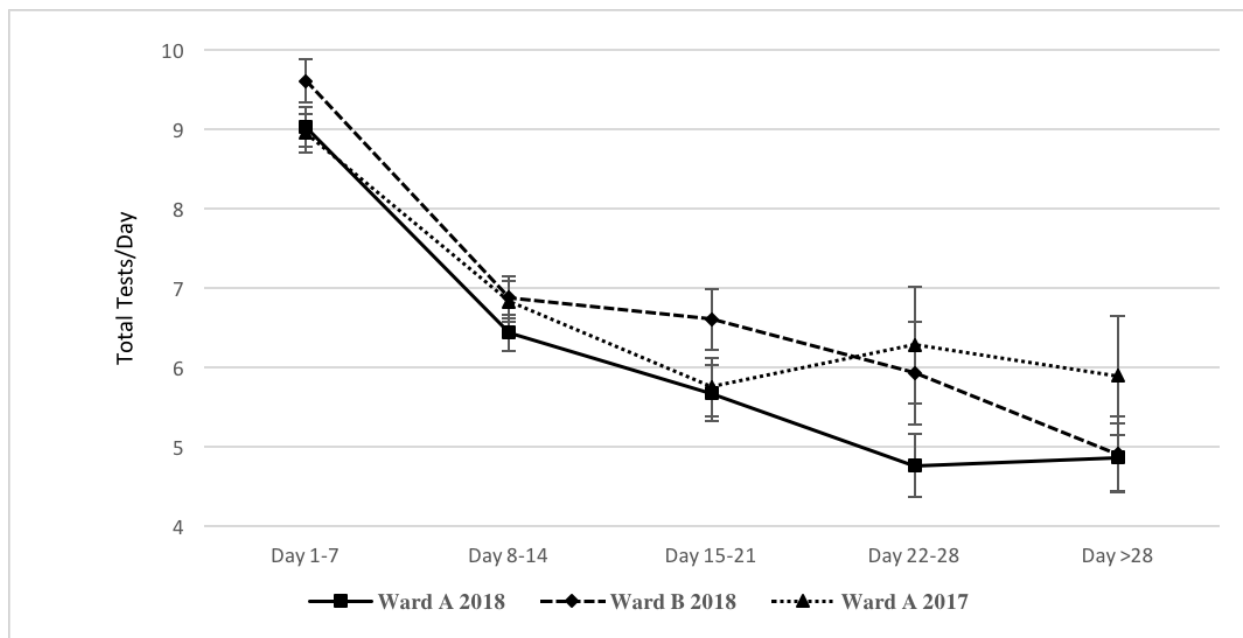
found when comparing Ward A to the historical control. This effect was most pronounced among patients admitted for 7-30 days.

**Interpretation:** In our study, the passive, easily-implemented, cost-negligible intervention of placing signs on clinicians' computers outlining recommendations for responsible test-ordering significantly reduced unnecessary testing.

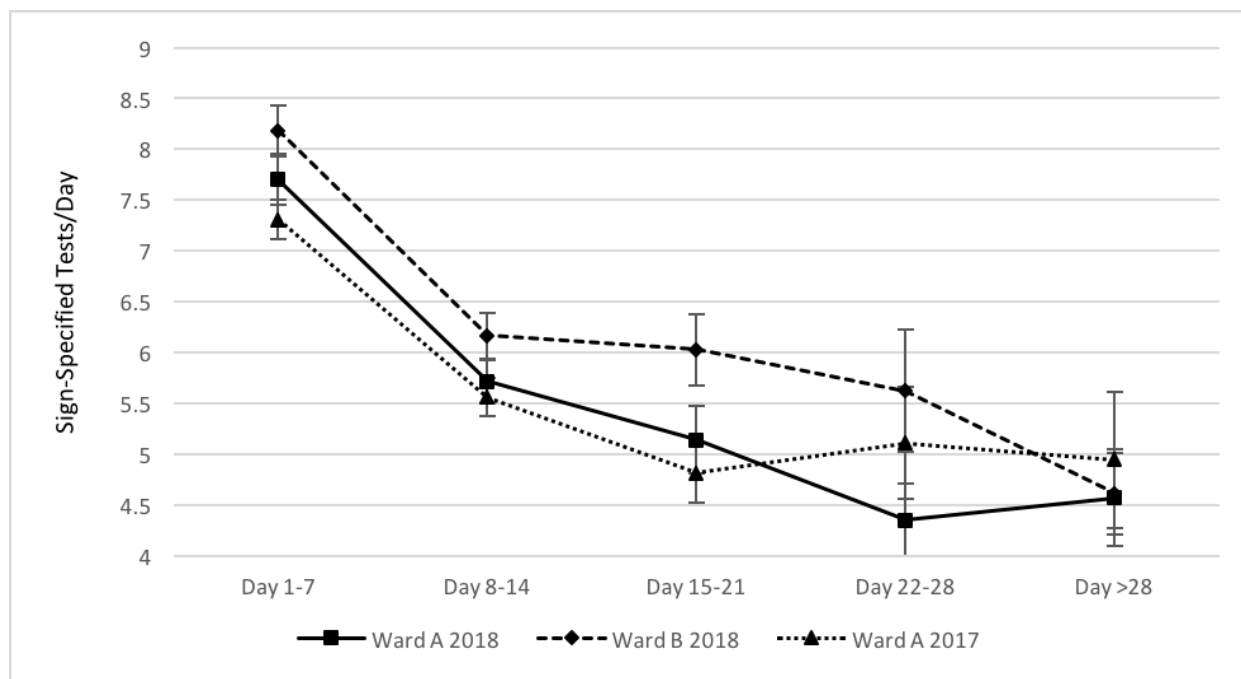
## FIGURES



**Figure 1.** The sign that was placed on all clinician computers on Ward A during the study period, containing various evidence-based recommendations regarding responsible test-ordering practices.



**Figure 2.** Reductions in total tests/patient-day were noted in patients admitted >8 days for patients admitted to Ward B and in patients admitted for >15 days for patients in the Ward A historical control.



**Figure 3.** Reductions in “sign-specified tests”/patient-day were noted in patients admitted >8 days for patients admitted to Ward B and in patients admitted for >15 days for patients in the Ward A historical control.

**TABLES**

	<b>Ward A 2018 (Intervention) n = 526 Patient Days = 5902</b>	<b>Ward B 2018 (Control) n = 522 Patient Days = 5786</b>	<b>Ward A 2017 (Control) n = 597 Patient Days = 6098</b>
<b>Age (years) μ (σ)</b>	61.9 (18.5)	63.0 (17.7) p = 0.97	64.4 (18.0) p = 0.92
<b>Gender M/F (%)</b>	50.1/49.9	55.3/44.7 p = 0.10	49.6/50.4 p = 0.86
<b>LOS (days) μ (σ)</b>	11.2 (10.8)	11.1 (10.8) p = 0.99	10.2 (9.3) p = 0.94
<b>Admission Hgb (g/L) μ (σ)</b>	116 (26.4)	113 (24.8) p = 0.93	116 (26.5) p = 1.00
<b>Δ Hgb (g/L) μ (σ)</b>	15.6 (14.8)	15.5 (15.1) p = 1.00	14.0 (13.5) p = 0.94
<b>Diagnosis (%)</b>			
<b>Cardiac</b>	9.3	9.4	8.9
<b>GI</b>	10.5	8.4	13.7
<b>GI Bleed</b>	5.9	5.4	5.9
<b>Resp</b>	17.3	20.9	17.9
<b>Malignancy</b>	4.6	3.1	3.5
<b>Infection</b>	16.3	12.8	14.4
<b>Neurologic</b>	12.2	13.6	10.4
<b>Hematologic</b>	3.2	1.9	2.2
<b>Renal</b>	4.9	4.8	5.2
<b>Endocrine</b>	3.2	3.3	3.4
<b>Deconditioning</b>	3.0	2.5	3.7
<b>Other</b>	9.5	14.0 <i>p = 0.03</i>	10.9

**Table 1.** Baseline clinical and demographic data for the three wards. There were no significant differences between any of the wards, with the exception that Ward B had slightly more patients with an “other” diagnosis.

	<b>Ward A 2018 (Intervention) n = 526 Patient Days = 5902</b>	<b>Ward B 2018 (Control) n = 522 Patient Days = 5786</b>	<b>Ward A 2017 (Control) n = 597 Patient Days = 6098</b>
<b>Total tests/day <math>\mu</math> (<math>\sigma</math>)</b>	7.38 (4.08)	8.20 (4.34) <b>p &lt; 0.01</b>	7.80 (4.24) <i>p = 0.09</i>
<b>Sign-specified tests/ day <math>\mu</math> (<math>\sigma</math>)</b>	6.43 (3.56)	7.15 (3.72) <b>p &lt; 0.01</b>	6.42 (3.63) <i>p = 0.96</i>
<b>CBC/day <math>\mu</math> (<math>\sigma</math>)</b>	0.80 (0.35)	0.86 (0.30) <b>p &lt; 0.01</b>	0.81 (0.38) <i>p = 0.65</i>
<b>“Chem 7”/day <math>\mu</math> (<math>\sigma</math>)</b>	0.87 (0.46)	0.96 (0.47) <b>p &lt; 0.01</b>	0.88 (0.46) <i>p = 0.72</i>
<b><math>\geq 1</math> CBC/day</b>	36.1%	42.5% <b>p = 0.04</b>	38.4% <i>p = 0.46</i>

**Table 2.** Among all patients, compared to Ward B, patients on Ward A underwent significantly fewer tests and were less likely to average  $\geq 1$  CBC/day. Patients on Ward A underwent fewer tests compared to the Ward A historical control, but this did not reach statistical significance.

	<b>Ward A 2018 (Intervention) n = 289 Patient Days = 3949</b>	<b>Ward B 2018 (Control) n = 278 Patient Days = 3615</b>	<b>Ward A 2017 (Control) n = 308 Patient Days = 3825</b>
<b>Total tests/day <math>\mu</math> (<math>\sigma</math>)</b>	6.14 (3.14)	6.96 (3.07) <b>p &lt; 0.01</b>	6.81 (3.52) <b>p = 0.01</b>
<b>Sign-specified tests/day <math>\mu</math> (<math>\sigma</math>)</b>	5.46 (2.83)	6.27 (2.86) <b>p &lt; 0.01</b>	5.56 (2.78) <i>p = 0.66</i>
<b>CBC/day <math>\mu</math> (<math>\sigma</math>)</b>	0.73 (0.31)	0.81 (0.29) <b>p &lt; 0.01</b>	0.74 (0.30) <i>p = 0.69</i>
<b>“Chem 7”/day <math>\mu</math> (<math>\sigma</math>)</b>	0.78 (0.33)	0.90 (0.38) <b>p &lt; 0.01</b>	0.80 (0.34) 0.47
<b><math>\geq 1</math> CBC/day</b>	23.2%	32.0% <b>p = 0.02</b>	26.0% <i>p = 0.45</i>

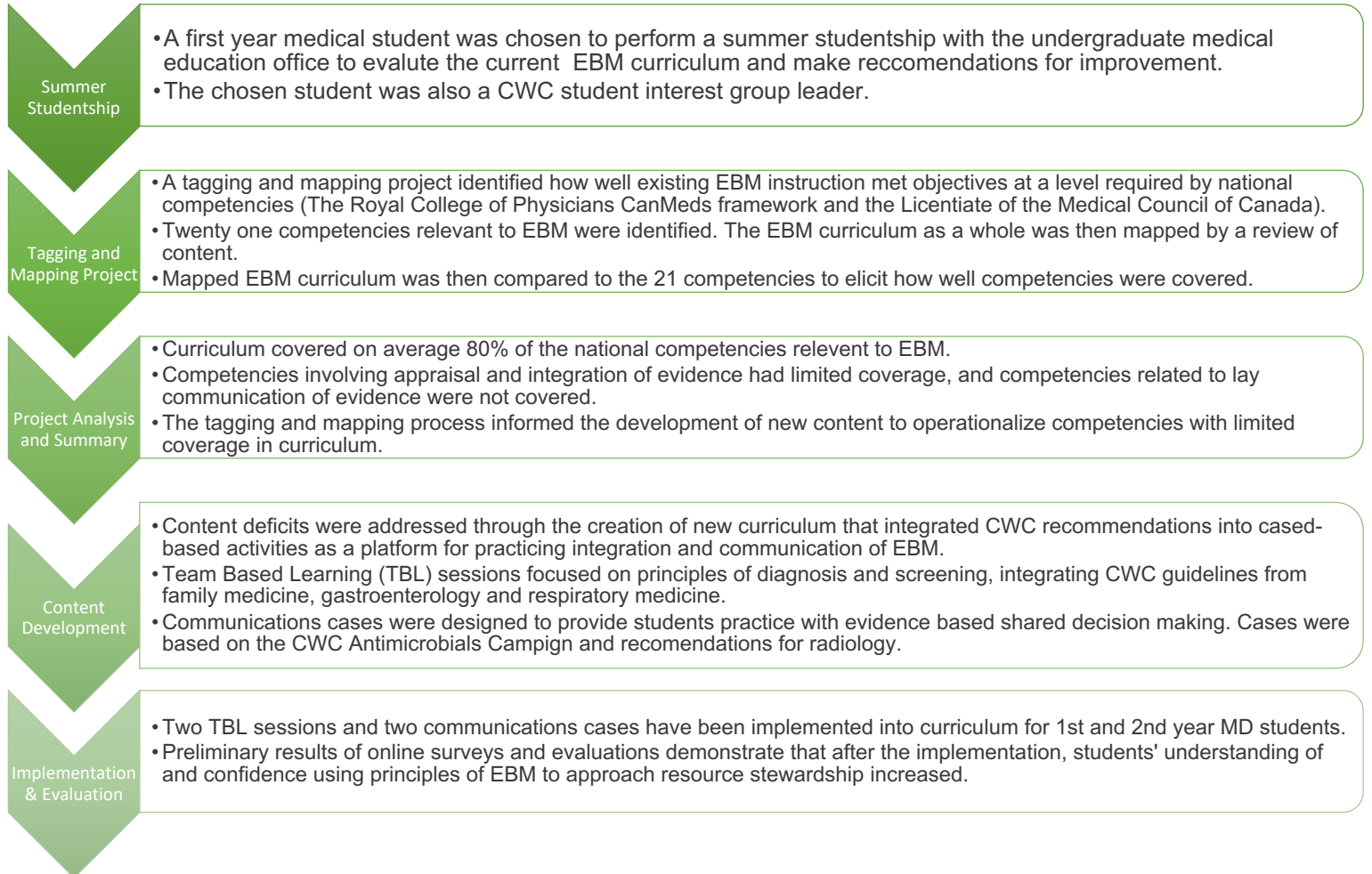
**Table 3.** Among patients with LOS between 7-30 days, patients on Ward A underwent significantly fewer tests compared to both Ward B and the Ward A historical control

# Incorporating Resource Stewardship through the Lens of Evidence Based Medicine (EBM) into the University of Alberta (UofA) Medical Education Curriculum

**Authors:** Goetz V., Love B.

## Synopsis of the University of Alberta (UofA) Initiative

- The main goals were 1) enhance training in EBM to increase student understanding and confidence and 2) Apply principles of EBM to case based activities that integrate Choosing Wisely Canada (CWC) recommendations for resource stewardship.



## Factors Attributing to its Success

- The ability to have a full-time summer student position to develop and launch the initiative allowed for efficient implementation in the fall and provided a framework for the other members of the UofA CWC Student Interest Group to build upon.
- Aligning the mandate of the CWC Student Interest Group to improve knowledge of resource stewardship with the priorities of the faculty to improve EBM instruction helped procure faculty support and resources.

## Future Directions and Advice to Others

- The Student Interest Group will keep building upon the EBM curriculum map to further identify areas for improvement and integration of CWC content. Areas that have been identified for further case based implementation of recommendations include Discovery Learning sessions and the Longitudinal Clinical Experience.
- Others institutions may choose to use the curriculum mapping approach described to identify optimal ways to integrate resource stewardship into an already expansive curriculum.





# Teaching the Future Leaders in High Value Care (HVC) Lessons learned from HVPAA Future Leaders program

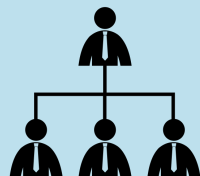
Largest national GME  
HVC curriculum in US

1 Year Program

7 Curriculum Directors



76 Residents/ Fellows



Smaller groups with  
similar Q/I projects  
mentored by each  
director



Web based Modules  
from IHI, Cost of care  
and Dell Medicine for  
didactics



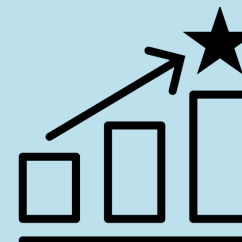
Monthly Phone call  
meeting



Trainees attend  
National HVPAA  
conference for free



74/76 trainees  
completed the  
programs



Self Reported  
Improvement in  
attitudes and Skills to  
provide HVC

Curriculum Directors: Remus Popa, Kencee Graves, Robert Fogerty,  
Chris King, Kshitij Thakur, Venkata Andukuri



# Quality of Care NL/Choosing Wisely NL Academic Detailing

**To engage further with family physicians on guidelines, recommendations and best practices, QCNL/CWNL launched an Academic Detailing program to encourage conversation between peer physicians.**

## Methodology

1. In Spring 2017, QCNL/CWNL delivered Academic Detailing to every clinic in the Eastern Health Region, based on the contents of Practice Points Volume 1.
2. In Fall 2017, QCNL/CWNL expanded the program. QCNL recruited Family Doctors as Clinical Leaders to assist in delivering Academic Detailing sessions throughout the Eastern region and CME credits were offered to family physicians that attended in-clinic Academic Detailing sessions. Detailing was based on Practice Points Volume 2.
3. Throughout Fall 2017 and Winter 2018, 12 Clinical Leaders held 26 accredited Academic Detailing sessions in-clinic for 97 family physicians. Those in attendance were provided hard copies of Practice Points Volume 2, as well as any available personal ordering data from QCNL/CWNL projects. For family physicians that could not attend an in-clinic session, a hard copy of their personal ordering data was delivered personally to the clinic by a Clinical Leader.

## Program Expansion

In Fall 2018, Academic Detailing will expand to engage all clinicians in all regions of the province. Clinical Leaders will be recruited to assist in delivering in-clinic sessions and web meeting technology will be used to enable discussion. Detailing will be based on the contents of Practice Points Volume 3.

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